

## REMARKS

### **I. Introduction**

With the cancellation without prejudice of claims 3 to 20, claims 1 and 2 are pending in the present application. In view of the foregoing amendments and the following remarks, it is respectfully submitted that all of the presently pending claims are allowable, and reconsideration is respectfully requested.

### **II. Rejection of Claims 1 to 2 Under 35 U.S.C. § 112**

Claims 1 to 2 were rejected under 35 U.S.C. § 112 as allegedly indefinite. While this rejection is not necessarily agreed with, to facilitate matters, claims 1 and 2 have been amended herein without prejudice to delete the phrase “at least predominantly,” thereby rendering moot the present rejection.

In view of all of the foregoing, withdrawal of this rejection is respectfully requested.

### **II. Rejection of Claims 1 to 2 Under 35 U.S.C. § 102(a)**

Claims 1 to 2 were rejected under 35 U.S.C. § 102(a) as anticipated by U.S. Patent Application Publication No. 2002/0057974 (“Toyama et al.”). It is respectfully submitted that Toyama et al. do not anticipate these claims for at least the following reasons.

Claim 1 relates to a pump device, including: at least one of: i) a piston and ii) sealing elements to seal the pump piston, the at least one of the pump piston and sealing elements having a coating containing at least one of i) halogen-, ii) silicon-, iii) carbon-containing, and iv) metal-organic monomers.

Although Applicants may not agree with the merits of the rejection, to facilitate matters, claim 1 has been amended to recite, *inter alia*, that **the coating includes: an inner adhesive layer including one of a) chromium, and b) silicon; at least one intermediate layer including one of a) chromium, b) tungsten, c) silicon, and d) carbon; and one of a) an outer, metal-free functional layer of diamond-like carbon (DLC), and b) an outer, metal-containing functional layer including tungsten carbide.** Support for these amendments may be found, for example, on page 20, lines 18 to 27 of the Specification.

Toyama et al. do not disclose, or even suggest, the above-mentioned feature. Toyama et al. do describe a compressor including a cylinder (1) and a

piston (3) inserted into the cylinder (1). In addition, as indicated in claim 7 of Toyama et al., a lubricating solid coat may be applied to an inner peripheral surface of the cylinder (1) and/or to an outer peripheral surface of the piston (3). However, as is apparent from paragraph [0038] of Toyama et al., the lubricating solid coat includes only a layer of PTFE or DLC, and not an inner adhesive layer including one of a) chromium, and b) silicon; at least one intermediate layer including one of a) chromium, b) tungsten, c) silicon, and d) carbon; and one of a) an outer, metal-free functional layer of diamond-like carbon (DLC), and b) an outer, metal-containing functional layer including tungsten carbide. Accordingly, it is respectfully submitted that Toyama et al. do not anticipate claim 1 for at least these reasons.

As for claim 2, which depends from claim 1 and therefore includes all of the features of claim 1, it is respectfully submitted that Toyama et al. do not anticipate claim 2 for at least the reasons set forth above.

In view of all of the foregoing, withdrawal of this rejection is respectfully requested.

### **III. Rejection of Claims 1 to 2 Under 35 U.S.C. § 102(b)**

Claims 1 to 2 were rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 6,283,478 ("Kumai et al."). It is respectfully submitted that Kumai et al. do not anticipate these claims for at least the following reasons.

As regards claim 1, Kumai et al. do not disclose, or even suggest, a coating for a piston and/or sealing elements, which includes an inner adhesive layer including one of a) chromium, and b) silicon; at least one intermediate layer including one of a) chromium, b) tungsten, c) silicon, and d) carbon; and one of a) an outer, metal-free functional layer of diamond-like carbon (DLC), and b) an outer, metal-containing functional layer including tungsten carbide. Kumai et al. do describe a piston ring structural body (10) that is fitted into a ring groove (120) of a piston (100) that slides against a cylinder wall (200). The piston ring structural body includes a coil expander (40), an inner ring (30) and an outer ring (20) that is pushed against the cylinder wall (200) by the coil expander (40). In addition, as indicated in column 5, lines 30 to 42 of Kumai et al., the outer ring (20) may be coated with diamond-like carbon, titanium nitride or chrome nitride. However, Kumai et al. nowhere mention that the coating on outer ring (20) includes an inner adhesive layer including one of a) chromium, and b) silicon; at least one intermediate layer including one of a)

chromium, b) tungsten, c) silicon, and d) carbon; and one of a) an outer, metal-free functional layer of diamond-like carbon (DLC), and b) an outer, metal-containing functional layer including tungsten carbide. Accordingly, it is respectfully submitted that Kumai et al. do not anticipate claim 1 for at least these reasons.

As for claim 2, which depends from claim 1 and therefore includes all of the features of claim 1, it is respectfully submitted that Kumai et al. do not anticipate claim 2 for at least the reasons set forth above.

In view of all of the foregoing, withdrawal of this rejection is respectfully requested.

#### **IV. Conclusion**

In light of the foregoing, Applicants respectfully submit that all pending claims are in condition for allowance. Prompt reconsideration and allowance of the present application are therefore earnestly solicited.

Respectfully submitted,

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